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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/535,567

05/19/2005

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EXAMINER

EOM, ROBERT J

ART UNIT

PAPER NUMBER

4153

MAIL DATE

DELIVERY MODE

11/07/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/535,567	<b>Applicant(s)</b> DAVIES ET AL.	
	<b>Examiner</b> ROBERT EOM	<b>Art Unit</b> 4153	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 10/01/2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-34 is/are pending in the application.
- 4a) Of the above claim(s) 1,23-26 and 28-32 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 2-22, 27, and 33-34 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05/19/2008 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |                                                                                        |                                                                   |
|----------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>05/19/2005, 07/12/2005</u> .                                  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicant's election without traverse of claims 2-30, 33 and 34 in the reply filed on October 01, 2008 is acknowledged.

2. Applicant's election of claims 2-30, 33 and 34 in the reply filed on October 01, 2008 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

3. Further, claims 1, 23-26, and 28-32, are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim. Election was made without traverse in the reply filed on October 01, 2008. Specifically:

- Claim 23, recites "A device according to claim 1, which further comprises an electronic component mounted onto at least some of the portions of the conducting lead frame not covered by the plastics housing.", the elected species A has no mention of any conducting lead frame or electronic component mounted thereon. Claim 23 is directed to non-elected species B (Fig. 10, see: electronic component 110).

- Claim 24 recites "A device according to claim 23, wherein the electronic component5 is a memory component.", the elected species A has no mention of any electronic component or memory component. Claim 24 is directed to non-elected species B (Fig. 10, see: electronic component 110).

- Claim 25 recites "A device according to claim 24, wherein the electronic memory component is an EEPROM.", the elected species A has no mention of any electronic component or EEPROM. Claim 25 is directed to non-elected species B (Fig. 10, see: electronic component 110).

- Claim 26 recites "A device according to claim 24, wherein the electronic memory component stores data relating to the or each gas sensitive element.", the elected species A has no mention of any electric memory component or EEPROM. Claim 26 is directed to non-elected species B (Fig. 10, see: electronic component 110).

- Claim 28 recites "A device according to claim 1, which further comprises a cap which covers at least some of the portions of the conducting lead frame not covered by the plastics housing.", the elected species A has no mention of any cap or conducting lead frame. Claim 28 is directed to non-elected species B (Fig. 11, see: top 112).

- Claim 29 recites "A device according to claim 1, wherein the gas sensitive element is a semiconductor gas sensor.", the elected species A has no mention of a semiconductor gas sensor, the gas sensitive element of species A is a "pellistor gas sensing element" (P11/L35). Claim 29 is directed to non-elected species B (Fig. 13, see: gas sensitive element 114; P19/L4-13).

- Claim 30 recites "A device according to claim 29, wherein the semiconductor has sensor comprises a o-type mixed metal oxide semiconducting material of the first, second and/or third order transition metal series and wherein the semiconductor gas sensor is responsive to a change in concentration of carbon monoxide in the surrounding atmosphere and to a change in concentration of oxygen in the surrounding

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atmosphere.”, the elected species A has no mention of a semiconductor gas sensor, the gas sensitive element of species A is a "pellistor gas sensing element" (P11/L35).

Claim 29 is directed to non-elected species B (Fig. 13, see: gas sensitive element 114; P19/L4-13).

### ***Specification***

4. The abstract of the disclosure does not commence on a separate sheet in accordance with 37 CFR 1.52(b)(4). A new abstract of the disclosure is required and must be presented on a separate sheet, apart from any other text.

### ***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 2, 4-5, 7-8, 14, 15, 18-21 and 27 are rejected under 35 U.S.C. 102(b) as being anticipated by Tindall et al. (USP 6,351,982 B1).

Regarding claim 2, Tindall et al. discloses a device for sensing a gas (Abstract), the device comprising at least one gas sensitive element (Fig. 2, see: sensing element 18) contained within a flameproof, plastics housing (Fig. 1, see: housing 10) supporting a flame arrestor which enables gas to flow into the interior of the housing (Fig. 2, see: sinter element 14), and the gas sensitive element[[[(s)]]] being connected to conducting leads which are accessible through, and are at least partially encapsulated by, the wall

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of the housing (Fig. 2, see: lead-in conductors 21), the encapsulating wall having sufficient thickness such that the housing will not allow the propagation of an ignition source from within the device to the ambient atmosphere, under working conditions (C1/L38-43).

Regarding claim 4, Tindall et al. discloses all of the claim limitations as set forth above. Tindall et al. further discloses wherein the flame arrestor is located above the gas sensitive element  $[(s)]$  (Fig. 2, see: sinter element 14), the conducting leads being accessible through a side wall of the housing (C3/L34-36).

Regarding claim 5, Tindall et al. discloses all of the claim limitations as set forth above. Tindall et al. further discloses the conducting leads are coupled with respective contacts located in an integral extension of the housing (C3/L34-36, see: sleeve portion 24).

Regarding claim 7, Tindall et al. discloses all of the claim limitations as set forth above. Tindall et al. further discloses the flame arrestor is a metal mesh (C5/L9-12).

Regarding claim 8, Tindall et al. discloses all of the claim limitations as set forth above. Tindall et al. further discloses the flame arrestor is joined to the plastics housing by a process of thermal bonding around its perimeter (C4/L54-58, see: injection molding process).

Regarding claim 14, Tindall et al. discloses all of the claim limitations as set forth above. Tindall et al. further discloses means for protecting one or more of the gas sensitive element  $[(s)]$  from shock damage (Fig. 2, see: supporting block 22).

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Regarding claim 15, Tindall et al. discloses all of the claim limitations as set forth above. Tindall et al. further discloses means for insulating the gas sensitive element ~~[[s]]~~ and electrical connections, either in terms of electrical insulation or heat insulation, or both (Fig. 2, see: epoxy resin encapsulant 25).

Regarding claim 18, Tindall et al. discloses all of the claim limitations as set forth above. Tindall et al. further discloses a compensating element (Fig. 2, see: reference element 19).

Regarding claim 19, Tindall et al. discloses all of the claim limitations as set forth above. Tindall et al. further discloses the compensating element comprises a catalytic bead (C3/L52).

Regarding claim 20, Tindall et al. discloses all of the claim limitations as set forth above. Tindall et al. further discloses the gas sensitive element positioned at least partly within ~~[[a or]]~~ a respective recess in an interior wall of the housing (Fig. 2, see: shoulder 28).

Regarding claim 21, Tindall et al. discloses all of the claim limitations as set forth above. Tindall et al. further discloses the recess also contains means for the protection and insulation of the gas sensitive element positioned at least partly inside it (Fig. 2, see: sensor retainer 16).

Regarding claim 27, Tindall et al. discloses all of the claim limitations as set forth above. Tindall et al. further discloses the plastics housing comprises at least an inner portion (Fig. 2, see: support ring 15) and an outer portion (Fig. 2, see: plastic first part

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11), the outer portion being moulded around the inner portion (C4/L11-13, see: molded interface 26).

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).



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10. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tindall et al. (USP 6,351,982 B1).

Regarding claim 22, Tindall et al. discloses all of the claim limitations as set forth above, but the reference does not explicitly disclose the thickness of the portion of the housing wall through which the conducting leads extend is substantially at least 6 mm. As the cost of manufacture and the ability of the sensor to withstand flames are variables that can be modified, by adjusting said thickness of the housing wall, with said manufacturing cost and flame durability increasing as the housing wall thickness is increased, the precise housing wall thickness cannot be considered critical.

Accordingly, one of ordinary skill in the art at the time the invention was made would have optimized, by routine experimentation, the thickness housing wall of Tindall et al. to obtain the desired balance between the manufacturing cost and the flame durability (In re Boesch, 617 F.2d. 272, 205 USPQ 215 (CCPA 1980)), since it has been held that where the general conditions of the claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. (In re Aller, 105 USPQ 223).

11. Claims 3 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tindall et al. (USP 6,351,982 B1), as applied to claim 2 above, in view of Daeche et al. (WO 00/00820 see: English language translation).

Regarding claims 3 and 6, Tindall et al. discloses all of the limitations as set forth above.

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Tindall et al. does not explicitly disclose the plastics housing is fabricated by moulding in situ the plastics material directly around the conducting leads. Further, Tindall et al. does not explicitly disclose the conducting leads are provided by a conducting lead frame fabricated prior to encapsulation by the plastics housing.

Daeche et al. teaches a combustible gas sensor (P3, see: paragraph 4) with a lead frame (Fig. 3, see: lead frame 1) which provides the external electrical connections for the gas sensor (Fig. 1, see: external connections 2). The housing is manufactured by molding plastic directly onto the lead frame (P5, see: plastic spraying process).

Tindall et al. and Daeche et al. are analogous because both references are directed to combustible gas sensors with plastic housings.

It would have been to one having ordinary skill in the art at the time of the invention to use the lead frame-direct molding manufacturing process in the gas sensor of Tindall et al., as taught by Daeche et al., since doing so allows a cost advantageous mounting and large-scale manufacture of combustible gas sensors (P4, see: paragraph 3).

12. Claims 9-13 and 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tindall et al. (USP 6,351,982 B1), as applied to claims 2 and 14 above, in view of Doncaster et al. (EP 0940680 A2).

Regarding claims 9, 12-13 and 16-17, Tindall et al. discloses all of the limitations as set forth above.

Tindall et al. does not explicitly disclose at least one filter, located inboard of the flame arrestor, in order to remove contaminants from the gas flow into the device such

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as hydrogen sulphide. Further, Tindall et al. does not explicitly disclose the protecting means comprise at least one layer of shock absorbent and insulating material which is made of glass wool.

Doncaster et al. teaches a combustible gas detector ([0001]) with a layer of glass microfibre insulating material protecting the catalytic bead sensing element (Fig. 2, see: insulating material 9). Additionally, Tindall et al. teaches a bronze sinter (Fig. 2, see: bronze sinter 10) which reacts with hydrogen sulphide to prevent some of it from reaching the sensing bead ([0020]).

Tindall et al. and Doncaster et al. are analogous because both references are directed towards combustible gas detectors.

It would have been obvious to one having ordinary skill in the art at the time of the invention to use a bronze sinter and a layer of glass microfibre insulating material in the gas sensor of Tindall et al., as taught by Doncaster et al., since doing so prevents catalyst inhibition, which is caused by hydrogen sulphide ([0004]) as well as allows the gas sensor to be operable at a relatively high temperature ([0020]).

Regarding claims 10 and 11, modified Tindall et al. discloses all of the claim limitations as set forth above. Tindall et al. further discloses comprises means for retaining components located outboard of the flame arrestor, the retaining means being provided by a bezel which fastens mechanically to the housing (Fig. 4, see: plastic first part 11)

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13. Claims 33 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Daeche et al. (WO 00/00820 see: English language translation), in view of Tindall et al. (USP 6,351,982 B1).

Regarding claims 33 and 34, Daeche et al. discloses a method of manufacturing a device for sensing a gas, the method comprising moulding a plastics housing in situ directly around a set of conducting leads (P5, see: plastic spraying process), mounting at least one gas sensitive element inside the housing and connecting it or them to the conducting leads (Fig. 3, see sensor element 3) which are accessible through, and at least partially encapsulated by, the wall of the housing (Fig. 1, see: external connections 2), the encapsulating wall having sufficient thickness that the housing will not allow the propagation of an ignition source from within the device to the ambient atmosphere, under working conditions (P3, see: paragraph 4).

Daeche et al. does not explicitly disclose securing a flame arrestor to the housing which completes the flameproof enclosure yet enables gas to flow into the interior, the flame arrestor being joined to the plastics housing by a process of thermal bonding around its perimeter.

Tindall et al. teaches a flammable gas detector (Abstract) comprising a plastic housing with a flame arrestor (Fig. 2, see: sinter element 14) which is joined to the plastic housing through thermal bonding (C4/L54-58, see: injection molding process).

Daeche et al. and Tindall et al. are analogous because both references are directed towards combustible gas sensors.

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It would have been obvious to one having ordinary skill in the art at the time of the invention to incorporate a flame arrestor in the combustible gas sensor of Daeche et al., as taught by Tindall et al., since the flame arrestor enables gas flow through the gas sensor but prevents the propagation of a flame front outside the housing (Tindall et al, C1/L44-58).

### ***Conclusion***

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ROBERT EOM whose telephone number is (571)270-7075. The examiner can normally be reached on Mon.-Thur., 9:00am-5:00pm, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Basia Ridley can be reached on (571)272-1453. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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